REMARKS

Very thanks for Examination's suggestion and thanks for finding some cited documents. The applicant may know more information about the invention. This case has been carefully reviewed and analyzed in view of the office action.

Since in above discussion, it is apparent that the instant invention is under substantial examination. Furthermore, as we know that may cite prior art has features of the present invention for comparing the novelty and inventive step of the present invention. It is now believed that the subject Patent Application has been placed in condition for allowance, and such action is respectively requested.

Respectfully submitted.

Chung-I. Chang

Dated: 03/06/2006

P.O.Box 166-13, Taipei, Taiwan

Colorimetry

Encl. 1.

From Wikipedia, the free encyclopedia

Colorimetry is the science that describe colors in numbers, or provides a physical color match using a variety of measurement instruments.

Contents

Who uses colorimetry?

Colorimetry is used in chemistry, and in industries such as color printing, textile manufacturing, paint manufacturing and in the display industry.

Overview of the instuments

A colorimeter takes 3 wideband readings along the visible spectrum to obtain a rough estimate of a color sample. For critical color matching a spectrophotometer that takes readings 31 times along the visible spectrum would be employed. A densitometer is sufficient to measure lightness and darkness. A spectroradiometer measures the colors of light sources.

Range of challenges in colorimetry

Colors that look the same seldom have the same spectral characterisitics in any colorimetric system you employ, even assuming identical viewing conditions and identical observers with normal color vision.

The measurement devices - in depth

Initially, the size of the filter chosen for the colorimeter is extremely important, as the wavelength of light that is transmitted by the colorimeter has to be same as that absorbed by the substance. Color can be measured using a spectrophotometer, which takes measurements in the visible region (and a little more on both ends,) of a given color sample. The spectral reflectance curve is the most accurate data that can be provided regarding a color's characteristics. However, a spectral reflectance curve is a graph of 31 readings taken at 10 nanometer increments along the electromagnetic spectrum from 400 to 700 nanometers. The plot is often referred to as the DNA of the color. However, what practical application do 31 values have? This is why the values are mathematically reduced to 3 values via a calculation that integrates the "standard observer" and your chosen light source, ending up with 3 tristimulus values, which need to be converted yet again into coordinates in the desired color space.

Colorimetry utilizes the standard color science calculations provided by the International Lighting Standards Commission (CIE) in 1931. Colorimetry is not an exact science due to the limitations inherent in the system (metamerism being the most troublesome), the design of the measurement devices, the values used to estimate a given light source, etc.

Some industries use only a row of pigments, a color they are told to match, color correct lighting, and their eyes. Silkscreen experts often find the science of colorimetry to be useless, for many can mix the required color in under 10 minutes.

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Colorimeter

From Wikipedia, the free encyclopedia

A **colorimeter** is generally any tool that characterizes colour samples to provide an objective measure of colour characteristics. In chemistry, the colorimeter is an apparatus that allows the absorbance of a solution at a particular frequency (colour) of visual light to be determined. Colorimeters hence make it possible to ascertain the concentration of a known solute, since it is proportional to the absorbance.

Different chemical substances absorb varying frequencies of the visible spectrum. Colorimeters rely on the principle that the absorbance of a substance is proportional to its concentration i.e., a more concentrated solution gives a higher absorbance reading. A filter in the colorimeter is used to select the color of light which the solute absorbs the most, in order to maximise the accuracy of the experiment. Note that the colour of the absorbed light is the 'opposite' of the colour of the specimen, so a blue filter would be appropriate for an orange substance. Sensors measure the amount of light which has passed through the solution, compared to the amount entering, and a display reads the amount absorbed.

A quantitative reading for the concentration of a substance can be found by making up a series of solutions of known concentration of the chemical under study, and plotting a graph of absorbance against concentration. By reading off the absorbance of the specimen substance on the graph, a value for its concentration is found.

In other applications, colorimeters are used to characterize and correct colour response in video monitors, or by photographers to calibrate colours in a photographic print. Colorimeters are also available for disabled people who suffer from blindness or colour blindness, where subjective colour names are announced based on objective measurements of colour parameters (e.g. hue, saturation and luminance).

See also Spectrometer for an overview of an instrument that similarly uses the property of colour in the assessment of chemical composition in astronomy and other applications.

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made for variation in the device without having to produce a new profile. The mechanism can be used by applications to allow users with relatively inexpensive and readily available instrumentation to apply corrections to individual output colour channels in order to achieve consistent results.

Two pieces of information are necessary for this compensation: the reference response and the current response. This tag type provides a mechanism that allows applications that create profiles to specify the reference response. The way in which applications determine and make use of the current response is not specified at this time.

The measurements are of the standard variety used in the photographic, graphic arts, and television industries for process control. The measurements are intended to represent colorant amounts and so different measurement techniques are appropriate for different device types.

It is the job of the profile creator to provide reference response data in as many measurement units as practical and appropriate so that applications may select the same units that are measured by the user's instrument. Since it is not possible in general to translate between measurement units, and since most instruments only measure in one unit, providing a wide range of measurement units is vital. The profile originator must decide which measurement units are appropriate for the device.

Here are some examples of suitable measurement units: For process colours, density should be reported. Red-filter density should be reported for the cyan channel, green-filter for the magenta channel, blue-filter for the yellow channel, and visual for the black channel. For other colorants, such as Spot colours or Hi-Fi colours, it is the responsibility of the profile creator to select the appropriate units of measure for the system being profiled. Several different density standards are used around the world, so it is important that profile creators report in as many different density units as possible. See Table 52 Examples of suitable density measurements are: Status T, Status E, Status I and DIN.

This structure relates normalized device codes that would result from a lut16Type tag with density measurements of the resulting colorant amount. Normalized device codes resulting from a lut8Type tag should first be multiplied by 257 (101h).

For those fields that have been structured in arrays of channel data, the channels are ordered as specified for the appropriate colour space in Table 31, "lut16Type channel encodings".

When used the byte assignment and structure shall be as given in Table 50.

Table 50 — responseCurveSet16Type structure

Byte Position	Field Length (bytes)	Content	Encoded as...
0..3	4	'rcs2' (72637332h) [response curve set with 2-byte precision] type signature	
4..7	4	reserved, must be set to 0	
8..9	2	number of channels	uInt16Number
10..11	2	count of measurement types	uInt16Number
12..m		an array of offsets, each relative to byte 0 of this structure, with one entry for each measurement type. Each will point to the response data for the measurement unit.	uInt32Number[...]
m+1..n		count response curve structures	see Table 51 below

Each response curve structure has the format shown in Table 51

Transferring Images with a Serial Cable

In the old days, most cameras used a serial connection cable to transfer pictures from the camera's memory to the computer. That's because most computers—both PC and Macintosh—have serial ports, and so camera makers were assured that their camera would work with your computer, no matter what kind you have.

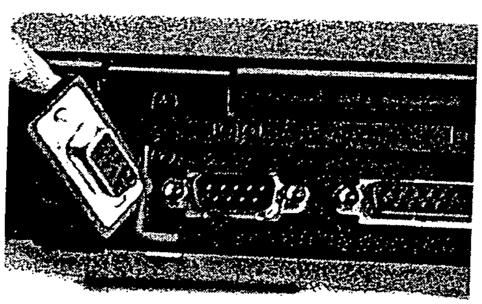
On the downside, your PC's serial port is slow, meaning that it can take a long time to copy images from the camera to the computer. The serial port is also kind of stupid; it doesn't know when something is plugged in to it, so you have to manually start the software needed to copy images. If you've already got something in the serial port, you might also have to remove that device and disable its software. Most computer manufacturers recommend that you shut off your PC before you insert and remove cables from the serial port, so that also entails a lot of rebooting.

If you're in the market for a new camera today, you'll find that they're almost all USB-based. You can discover a lot of used cameras with serial connections, though (like on eBay), and I emphatically recommend that you avoid them.

Connecting Your Camera with Serial

If you have a camera that uses a serial cable, here's a general overview of what you need to do to get images from your camera to the PC:

1. Shut off your PC. Be sure to shut down your PC using the Start | Shut Down menu item in Windows.
2. Check the back of your PC. If there's already a serial device (like a modem or Palm cradle) connected, unplug it now. Plug the camera's serial cable into the back of the PC now.



3. Plug the other end of the serial cable into your camera.
4. If your camera has an AC adapter, plug it in now. Serial transfers can be slow and drain a lot of battery life, so avoid transferring images with battery power alone.
5. Start your PC and wait for Windows to appear.

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Tip 2: Use Your Image Management Program Wisely

TIP

Create Individual Folders for Shoots

If you've just returned from a shoot where all images were shot with the same digital camera, download all the files into the same folder. This makes it easier to both locate and rename all the files with the greatest efficiency with the Photoshop File Browser.

Three image management programs were introduced in Chapter 1: iPhoto, Adobe Photoshop Album, and Canto Cumulus. No matter which application you like, there's a certain process that you should always follow when you start to use these programs.

If you have either Adobe Photoshop Album or iPhoto 2, be sure to do the following to avoid headaches:

1. *Eliminate duplicates.* It is a good idea to rid yourself of all duplicate files on your system before you create your first catalog. Otherwise, you'll have many more files to manage, which can suck up all the time you should be spending hiking, going to movies, or getting quality time with the family.
2. *Create a catalog.* In the terminology of these two programs, a catalog is a database of image thumbnails, as well as user-supplied information such as captions, notes, and tags. You can have the program catalog all the image files on your system, or you can specify that only certain drives or folders be included. For example, I create one catalog for all my screen shots, book illustrations, and business graphics and another exclusively for photographs. This makes it much easier to sort and find what I am specifically looking for. Unfortunately, catalogs only *reference* images throughout the system. Both programs will lose track of files if you delete them or move them to a different location, or inadvertently change a drive letter.
3. *Tag files by category and subcategory.* The idea behind tagging is to get all your images, regardless of their location, organized by category and subcategory. Only Photoshop Album specifically uses tags, but you can accomplish the same thing with iPhoto 2. Each tag is simply a descriptive reference to that file—it does not alter the file itself. Photoshop Album has a fixed set of category tags, but you're allowed to create subcategories and new categories. You can also assign multiple category tags to a photo. For example, you can have a category called Women, and subcategories called Women in Business, Glamour, Girls, etc. Then, when you want to create a project that will involve only certain images within a limited number of categories, you can display only the images with that tag by simply clicking on the tag. This becomes extremely powerful when it comes time to create projects (see Chapter 14) because you can quickly

Digital Photography: Expert Techniques

by Ken Milburn

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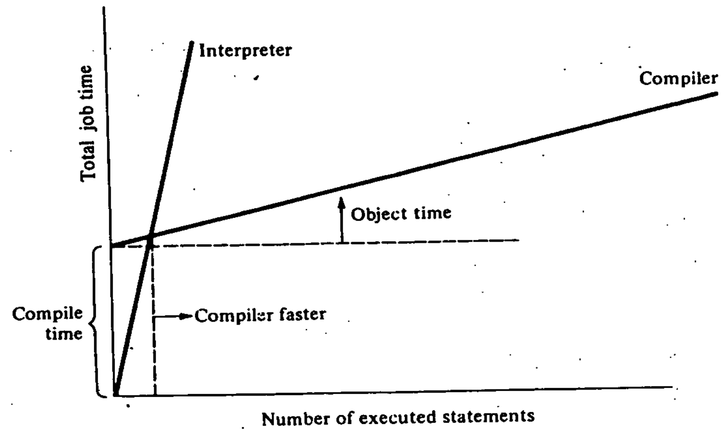

FIG. 10-3 Sketch of compiler vs. interpreter performance considerations

statements rather than on productive execution. The relative performance properties of compilers vs. interpreters is sketched in Fig. 10-3. It is seen that the interpreter may be faster for very short-running programs (especially one with no loops, due to the initialization of the compiler), but that the compiler is better for almost any looping program. However, the interpreter, since it translates each statement as it executes the statement, can easily permit changes in the program without the need to recompile. It can also permit the language to be somewhat more convenient, since it depends on "last-moment" information about storage allocation and resource use, while the compiler must know by user declaration or rules about these things **before** the program is run (when it is translated). To put it another way, an interpreter requires the latest possible binding time of user-oriented names and parameters to machine resources. Actually, the distinction between compiler and interpreter need not be as strict as it might seem from the above discussion, which for exposition purposes emphasizes the differences. Nevertheless, the more a compiler uses interpreter techniques, the better the convenience for the user, but the poorer the running time.

It cannot be too strongly emphasized that the essential man-machine interaction facilities, which include editing of program and data operations, are usually very frequent, but usually require very little computation time. For this reason, they will be called **trivial tracts.** In a sense, this is an unfortunate term, since they rank highest in the importance of being serviced quickly. In other words, fast responses to trivial requests are not only possible, but essential.

The requirement of fast response to trivial tracts may be viewed as a special case of a more general principle of man-machine psychology:

A Response Design Principle

The system should be designed to give fastest response to those requests that the human user expects to be quickly processed, provided that each such request, when run alone, can be processed in a short time.

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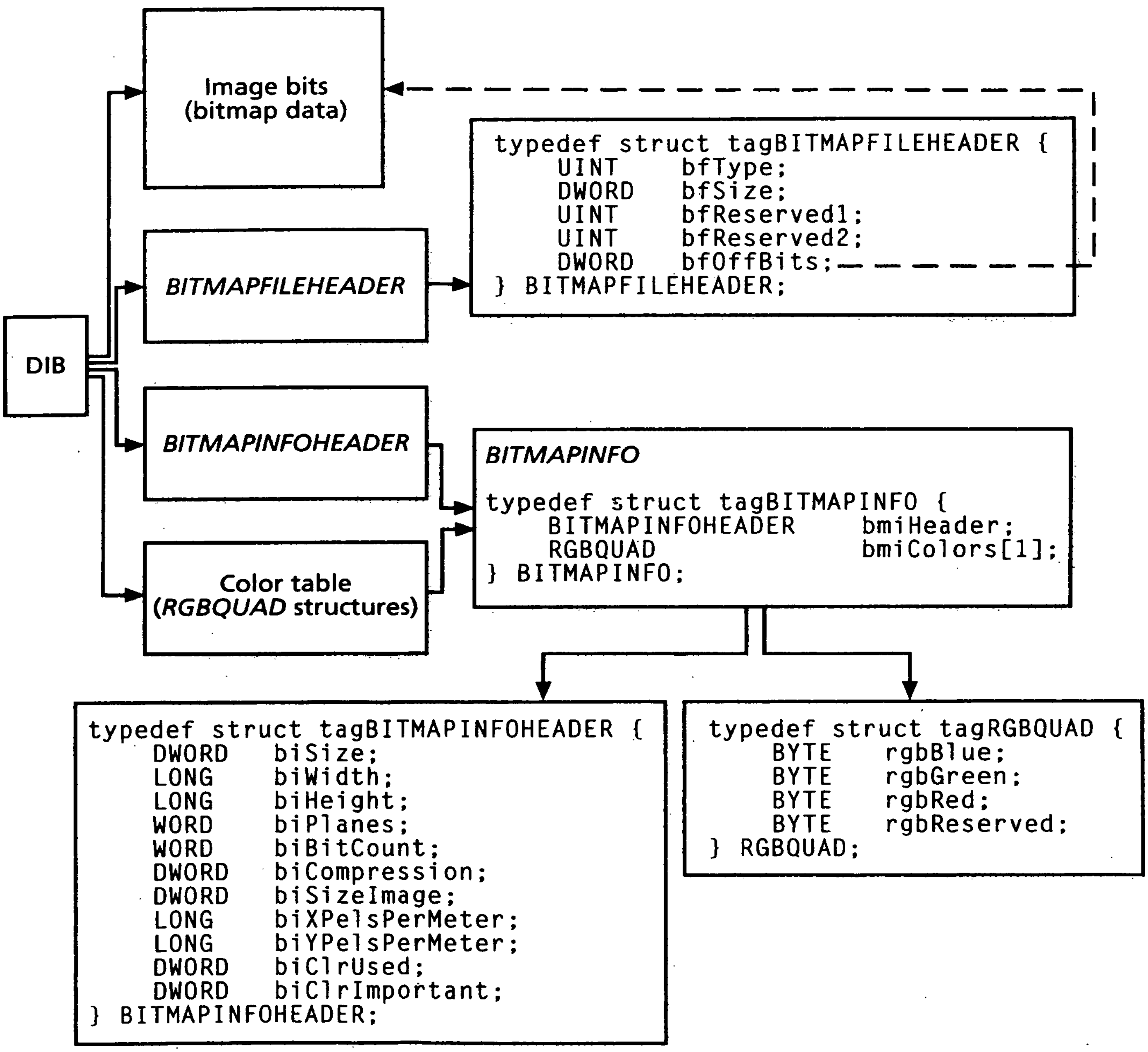
Image bits
(bitmap data)
BITMAPFILEHEADER
DIB
BITMAPINFOHEADER
Color table
(RGBQUAD structures)
typedef struct tagBITMAPFILEHEADER {
UINT bfType;
DWORD bfSize;
UINT bfReserved1;
UINT bfReserved2;
DWORD bfOffBits;
} BITMAPFILEHEADER;
BITMAPINFO
typedef struct tagBITMAPINFO {
BITMAPINFOHEADER bmiHeader;
RGBQUAD bmiColors[1];
} BITMAPINFO;
typedef struct tagBITMAPINFOHEADER {
DWORD biSize;
LONG biWidth;
LONG biHeight;
WORD biPlanes;
WORD biBitCount;
DWORD biCompression;
DWORD biSizeImage;
LONG biXPelsPerMeter;
LONG biYPelsPerMeter;
DWORD biClrUsed;
DWORD biClrImportant;
} BITMAPINFOHEADER;
typedef struct tagRGBQUAD {
BYTE rgbBlue;
BYTE rgbGreen;
BYTE rgbRed;
BYTE rgbReserved;
} RGBQUAD;

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